

What is Claimed is:

1. A scaffold for tissue engineering comprising biocompatible, biodegradable polymer-based, lighter than water or light as water microcarriers.

5 2. The scaffold of claim 1 which is seeded with cells via culturing *in vitro* in a rotating bioreactor.

3. The scaffold of claim 2 wherein the seed cells comprise osteoblast and osteoblast-like cells, endocrine cells, fibroblasts, endothelial cells, genitourinary cells, 10 lymphatic vessel cells, pancreatic islet cells, hepatocytes, muscle cells, intestinal cells, kidney cells, blood vessel cells, thyroid cells, parathyroid cells, cells of the adrenal-hypothalamic pituitary axis, bile duct cells, ovarian or testicular cells, salivary secretory 15 cells, renal cells, chondrocytes, epithelial cells, nerve cells or progenitor cells.

4. A method for producing scaffolds for tissue engineering comprising:

(a) preparing biocompatible, biodegradable polymer-based microcarriers which are lighter than water; 20  
(b) bonding the biocompatible, biodegradable polymer-based microcarriers into a scaffold; and  
(c) seeding the scaffold with cells via culturing *in vitro* in a rotating bioreactor.

25 5. A method for regenerating a selected tissue comprising seeding the scaffold of claim 1 with cells which generate the selected tissue and culturing the scaffold and seeded cells in a rotating bioreactor.

6. The method of claim 5 wherein the seed cells 30 comprise seed cells comprise osteoblast and osteoblast-like

cells, endocrine cells, fibroblasts, endothelial cells, genitourinary cells, lymphatic vessel cells, pancreatic islet cells, hepatocytes, muscle cells, intestinal cells, kidney cells, blood vessel cells, thyroid cells,  
5 parathyroid cells, cells of the adrenal-hypothalamic pituitary axis, bile duct cells, ovarian or testicular cells, salivary secretory cells, renal cells, chondrocytes, epithelial cells, nerve cells or progenitor cells.